REMARKS

The Final Office Action mailed April 20, 2004, has been received and reviewed. Claims 1 through 31 and 33 through 56 are currently pending in the application. Although the Final Office Action includes claim 32 as a pending claim, claim 32 was previously canceled by Amendment filed April 21, 2003. Claims 36 through 40 and 44 through 56 have been withdrawn from consideration as being drawn to non-elected invention(s). Claims 1 through 7, 9, 11, 25, and 41 stand rejected. Claim 35 is allowed. Claims 8, 10, 12 through 24, 26 through 31, 33, 34, 42, and 43 have been objected to as being dependent upon rejected base claims, but the indication of allowable subject matter in such claims is noted with appreciation. Applicants propose to amend claims 1 and 26, and respectfully request reconsideration of the application as proposed to be amended herein.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. 4,429,579 to Wilhelm

Claims 1 through 5 and 41 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Wilhelm (U.S. Patent No. 4,429,579). Applicants respectfully traverse this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Wilhelm discloses a load sensor for measuring the tension level on rods. The load sensor comprises a sensing member 22 that is inserted into a bore 20 extending axially through a tie rod 10 (Fig. 1). Sensing member 22 includes two enlarged end portions 24 and 26 and a narrower central shaft portion 28 (Fig. 2). End portion 24 of sensing member is countersunk to receive a ball 30 which concentrate the forces applied by the tie rod onto sensing member 22 (col. 2, lines 49-53). A bolt 32 (and an optional spacer 34) applies force to the opposite end portion 26 to compress sensing member 22 to a predetermined level (Fig. 1 and col. 3, lines 17-21).

Sensing member 22 further includes four strain gauges 38 that are positioned 90° apart around the circumference of central shaft portion 28 (col. 2, line 65 – col. 3, line 1). When tie rod 10 is placed in tension, strain gauges 38 provide a measure of the tension through wires 40 connected to meter 42. Wilhelm describes the operation of the tension measurement as follows:

> By tightening the bolt 32, the sensing member 22 is compressed to a predetermined level. When the tie rod 10 is placed in tension, the strain gauges 38 mounted on the sensing member 22 will detect a decrease in the amount of pre-loaded compression. Such a decrease is proportional to the amount of tension applied to the tie rod 10. By properly calibrating the meter 42, an accurate measure of the tension on the tie rod can be obtained (col. 3, lines 20-29).

Applicants respectfully submit that Wilhelm fails to disclose, either expressly or inherently, all of the elements recited in Claims 1 through 5, and 41.

Claims 1 and 41 recite the limitation of "sensing a bending strain in the bending portion exclusive of a net axial strain." The Office has argued that this limitation is a recitation with respect to the manner in which a claimed apparatus is intended to be used. As such, the Office asserts that strain gauges 38 of Wilhelm disclose this limitation because a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all of the structural limitations of the claims. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

Initially, Applicants note that claim 41 is a **method** claim. The concept that the prior art must teach only the structural limitations of the claim as relied on by the Office in the present rejection applies to apparatus claims, not method claims, and is therefore irrelevant to an analysis of claim 41. *See* M.P.E.P. § 2114. Rather, a prior art device is considered to anticipate a claimed method if, in its normal and usual operation, it would necessarily perform the method claimed. *See* M.P.E.P. § 2112.02.

There is no disclosure by Wilhelm that strain gauges 38 measure bending strain in sensing member 22 in any way that would be **exclusive of net axial strain**. In fact, Wilhelm is directed to sensing *tension* along the axis of tie rod 10 and makes no mention of sensing bending strain. Wilhelm specifically states that "[t]he strain gauges will measure the amount of tension applied to the tie rod as a decrease in the amount of pre-loaded compression" (col. 1, line 68 to

col. 3, line 2). As such, Wilhelm expressly indicates that the measurements provided by strain gauges 38 are **not** exclusive of net axial strain.

The Office's assertion that the positioning of strain gauges 38 would inherently detect bending strain in sensing member 22 does not overcome this deficiency. At best, any inherent measurement of bending strain would be combined with the measurement of the change in compression, or net axial strain, on sensing member 22, and would, therefore, not be exclusive. Furthermore, it is not clear that strain gauges 38 would be even be capable of inherently detecting a bending strain. As previously discussed, Wilhelm discloses that sensing member 22 is compressed against ball 30, which concentrates the forces applied to sensing member 22 via the countersunk end 24. Such a configuration would appear to focus any forces translated from tie rod 10 along the central axis of sensing member 22, and thereby **eliminate possible bending stresses**.

Accordingly, Wilhelm clearly fails to describe the claim 41 method limitation of "sensing a bending strain in the bending portion exclusive of a net axial strain." Claim 41 is, therefore, allowable over Wilhelm under the provisions of 35 U.S.C. § 102(b).

With respect to claim 1, Applicants respectfully submit that the limitation of a sensing device "for sensing a bending strain in the bending portion exclusive of a net axial strain" is also not recited in terms of the manner in which the apparatus is intended to be used. Rather, this limitation describes the sensing device in terms of it sensing capabilities and, therefore, imparts structural features that are necessary to the configuration of the sensing device in order to sense a bending strain excusive of a net axial strain. In Wilhelm, on the other hand, strain gauges 38 are merely described at being attached to the central shaft 28 of sensing member 22 for measuring *tension* in a rod. There is no indication that strain gauges 38 are attached or oriented on central shaft 28 that would allow strain gauges 38 to measure bending strain exclusive of net axial strain. Likewise, while Wilhelm discloses gauges 38 are electrically connected in a bridge circuit over a pair of wires 40, there is no indication that wires 40 connect gauges 38 in a configuration that allows strain gauges 38 to measure bending strain exclusive of net axial strain.

Therefore, Applicants submit that the limitation of a sensing device "for sensing a bending strain in the bending portion exclusive of a net axial strain" imparts structural features to

claim 1 that are not described by Wilhelm. Nevertheless, in order to eliminate any confusion regarding the structure of the sensing device recited in claim 1, Applicants propose to amend claim 1 to clearly recite the features of the claimed sensing device in terminology that is more structural in nature. Specifically, Applicants propose to amend claim 1 to recite "a sensing device positioned at the pin member body within the bending portion *having a plurality of sensor elements configured in an arrangement* for sensing a bending strain in the bending portion exclusive of a net axial strain" (emphasis added).

In view of the foregoing, Applicants submit that claim 1, as proposed to be amended, is allowable over Wilhelm under the provisions of 35 U.S.C. § 102(b). Claims 2 through 5, are also allowable in depending from and incorporating all of the limitations of claim 1. Moreover, Claim 3 recites the additional limitation "wherein the pin member body comprises a bolt." Sensing member 22 of Wilhelm, which the Office has indicated is analogous to the claimed pin member body, is not a bolt. Rather, sensing member 22 is compressed by application of a **separate** bolt 32 (col. 2, lines 53-56). Claim 3 is allowable over Wilhelm for that reason as well.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 4,429,579 to Wilhelm in View of U.S. Patent No. 4,553,124 to Malicki

Claims 6, 7, 9, 11, and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wilhelm (U.S. Patent No. 4,429,579) in view of Malicki (U.S. Patent No. 4,553,124). Applicants respectfully traverse this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

The 35 U.S.C. § 103(a) obviousness rejections of claims 6, 7, 9, 11, and 25 are improper because they fail to establish a *prima facie* case of obviousness.

Malicki teaches a strain gauge transducer assembly 10 for use within a bolt 12 (Fig. 1). Transducer assembly 10 includes strain gauges 46 that are mounted on oppositely facing surfaces of a web portion 40 (Fig. 3). In one embodiment, strain gauges 46 include both axial tension sensors T1 and T2 and transverse compression sensors C1 and C2 (Figs. 4 and 5 and col. 5, lines 41-54). In this manner, strain gauges 46 can be combined in various ways to compensate for measurement errors due to bending and temperature (col. 5, line 55 – col. 6, line 37).

Claim 1, from which claims 6, 7, 9, 11, and 25 depend, recites the limitation of "a sensing device positioned at the pin member body within the bending portion *having a plurality of sensor elements configured in an arrangement* for sensing a bending strain in the bending portion exclusive of a net axial strain" (emphasis added). As previously discussed with respect to claim 1, Wilhelm fails to disclose this limitation.

Malicki fails to provide any teaching that would overcome the foregoing deficiencies of Wilhelm with respect to claim 1. As with Wilhelm, there is no disclosure by Malicki that strain gauges 46 are capable of measuring bending strain in web portion 40 in any way that would be **exclusive of net axial strain**. Not only does Malicki fail to provide the teaching of measuring bending strain exclusive of net axial strain**, it teaches directly away** from such a sensor configuration by disclosing that it is desirable to eliminate errors introduced by bending loading (col. 5, line 55 – col. 6, line 37). Malicki expressly states that it is preferable that the strain gauges "be positioned close to the neutral axis of bending so that gauge misalignment *does not result in readings that are substantially affected by bending loading*" (col. 4, lines 56-63)(emphasis added).

Accordingly, the combination of Wilhelm and Malicki fails to teach or suggest all of the limitations of claim 1, and claim 1, as proposed to be amended, is allowable over the cited references under the provisions of 35 U.S.C. § 103(a). As such, claims 6, 7, 9, 11, and 25, which depend from claim 1, are also allowable. If an independent claim is nonobvious under 35 U.S.C.

103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Furthermore, claim 6 recites the additional limitation of sensor elements for "measuring bending strain along the x axis" and "measuring bending strain along the y axis." Neither of the cited references, alone or in combination, disclose separate sensor elements for measuring bending strain in both the x and y axis, as the references do not even disclose measuring bending strain. Likewise, claim 25 recites the additional limitation wherein the sensing device has "an axial stress measurement configuration and a bending measurement configuration." There is nothing in either Wilhelm or Malicki that would teach or suggest a sensing device that has separate measurement configuration. Claims 6 and 25 are allowable over the cited references for those reasons as well.

Objections to Claims 8, 10, 12 through 24, 26 through 31, 33, 34, 42, and 43/Allowable Subject Matter

Claims 8, 10, 12 through 24, 26 through 31, 33, 34, 42, and 43 stand objected to as being dependent upon rejected base claims, but are indicated to contain allowable subject matter and would be allowable if placed in appropriate independent form. Claim 26, as proposed to be amended, has been amended into independent form as suggested by the Office and is, therefore, allowable. Claims 27 through 31, 33, and 34 depend from claim 26 and are also allowable. Applicants respectfully submit that claims 8, 10, 12 through 24, 42, and 43 are allowable in their present form as depending from claim 1 or claim 41.

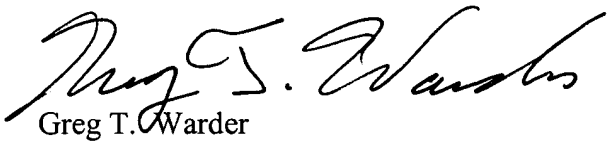
ENTRY OF AMENDMENTS

The proposed amendments to claims 1 and 26 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. Finally, if the Examiner determines that the amendments do not place the application in condition for allowance, entry is respectfully requested upon filing of a Notice of Appeal herein.

CONCLUSION

Claims 1 through 31, 33 through 35, and 41 through 43 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



Greg T. Warder
Registration No. 50,208
Attorney for Applicant(s)
TRASKBRITT
P.O. Box 2550
Salt Lake City, Utah 84110-2550
Telephone: 801-532-1922

Date: June 21, 2004
GTW/ps:ljb
Attachments: Appendix Including Replacement
Formal Drawings

Document in ProLaw